

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In the Application of Edwin Becker et al

Ser.No.: 10/633,265

Filed: August 1, 2003

For: METHOD AND APPARATUS FOR MONITORING THE QUALITY OF LUBRICANT

Commissioner of Patents

Alexandria, Virginia 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

In accordance with 37 CFR § 1.56, Applicant wishes to call the attention of the Examiner to the following references:

- 1) US 5,719,392
- 2) US 6,175,111
- 3) DE 39 31 497
- 4) DE 41 26 927
- 5) US 6,032,100
- 6) EP 0 672 243
- 7) DE 199 33 924
- 8) WO 95/00833
- 9) DE 39 04 142
- 10) DE 196 50 397
- 11) XP-002253739, Levermore Article

12) US 6,421,588

13) WO 98/53296

14) WO 96/18893

15) US 6,225,623

16) WO 01/73816

17) XP-002253740, Article, Thomas Fruh

18) XP-002253741, Article, Dipl.-Ing. F. Plenert

Reference 1, US 5,719,392 (which is the equivalent of DE 195 15 270), is in the English language and therefore does not require further discussion as to its relevance.

Reference 2, US 6,175,111 (which is the equivalent of DE 198 40 763), is also in the English language and therefore also does not require further discussion as to its relevance.

Reference 3, DE 39 31 497, discloses an arrangement that has a sensor head with electronic evaluation for detecting particles of different specific wt. from the fluid. The fluid passing through the sensor head is converted into a rotary flow. The particles are forced into zones within the head for measurement by virtue of their different specific weight and the action of their forces and accelerations. USE - For detecting particles of metal or air or water bubbles in fluid, esp. lubricant, for reliable estimation of damage in lubricated system.

Reference 4, DE 41 26 927, discloses an oil state monitoring arrangement for moving machines which contains a sensor that detects the oil (Sch) changing from the neutral to an acidic state during use. The sensor and a temperature compensation device are connected to an evaluation circuit with a warning element. The sensor has a resistive sensor element (SE) consisting of an easily oxidized metal wire and is integrated into a component on the machine (M) for purging the oil. The temperature

compensation arrangement contains a temperature sensor and an electronic comparison element in the evaluation circuit. USE/ADVANTAGE - Especially for monitoring the state of lubricating oil in the internal combustion engine with a basic resistance in the unused state achieved with an additive. The arrangement enables the operator of the machine to detect a critical change in the state of the lubricating oil.

Reference 5, US 6,032,100 is in the English language and therefore does not require any further discussion as to its relevance.

Reference 6, EP 0 672 243 (Equivalent to DE 693 28 259) is in the English language and therefore does not require further discussion as to its relevance.

Reference 7, DE 199 33 924, discloses a micro-system that has one or more sensors of physical parameters directly or indirectly related to the operating state of each machine, etc., or of those for which state monitoring is considered necessary, components for measurement signal processing in accordance with the implemented algorithms and components for storing measurement data and/or data derived by algorithms. The system stores measurement and/or diagnostic signals with time information locally, preferably compressed and/or reduced, to enable reconstruction of a state change against time.

Reference 8, WO 95/00833 (equivalent of DE 43 20 943) is in the English language and therefore needs no further discussion as to its relevance.

Reference 9, DE 39 04 142, discloses a method for the on-line monitoring of motor oils, in which biosensors are used as indicators of changes in the motor-oil properties.

Reference 10, DE 196 50 397, discloses that determining the degree of wear of oil comprises using absorption and transmission of infra-red radiation in the region around 10.3  $\mu\text{m}$ .

Reference 11 – 15 are all in the English language and therefore need no further discussion as to their relevance.

References 16, WO 01/73816, discloses an invention that relates to a method and a device for detecting compounds in a gas stream, enabling a plurality of compounds in the analysis gas to be characterized almost simultaneously. The gas stream containing the compounds is guided into the ionization chamber of a mass spectrometer and exposed to radiation with a UV laser pulse. The resulting ions are detected in the mass spectrometer. The gas stream is exposed to said radiation with said UV laser pulses at regular or irregular intervals by alternate exposure to a vacuum ultraviolet (VUV) laser pulse in the ionization chamber, the resulting ions being detected in the mass spectrometer.

Reference 17, SP-002253740, article by Thomas Früh, discloses an electronic “nose” that can “smell” gases that occur as oils age, reliably indicating when the oil in machines should be changed. This reduces maintenance and material costs and also reduces equipment down times. The electronic nose is based on an oscillating quartz crystal with a thin coating that binds gases that escape from the aging oil. Tiny deposits of material reduce the clock frequency of the oscillating quartz. A total of six oscillating quartzes are each individually coated and each react to different materials.

Reference 18, is in the English language and therefore also does not need further discussion as to its relevance.

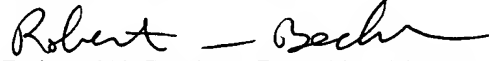
Copies of the listed documents are submitted herewith along with the form PTO-

1449.

It is respectfully requested that any fees required and not enclosed herewith or any shortages in any fees be charged to Deposit Account 02-1653.

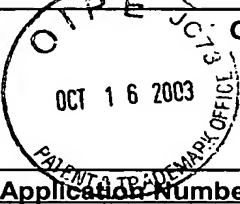
Consideration of the foregoing in relation to this application is respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Robert W. Becker".

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RWB/rac  
Enclosures

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>			<b>Complete if Known</b>
	<b>Application Number</b>	10/633,265	
	<b>Filing Date</b>	August 1, 2003	
	<b>First Named Inventor</b>	Edwin Becker et al	
	<b>Group Art Unit</b>		
	<b>Examiner Name</b>		
	<b>Attorney Docket No.</b>	2646 US	

U. S. PATENT DOCUMENTS							
Examiner Initials	Cite No.	Patent Number Pub. Number	Issue Date Pub. Date	Patentee	Class	Subclass	Filing Date
	1	5,719,392	2/17/1998	Frantzen			4/24/1996
	2	6,175,111	1/16/2001	Sorita et al			7/30/1998
	5	6,032,100	2/29/2000	Forfitt et al			6/12/1996
	12	6,421,588	7/16/2002	Janata			8/14/2000
	15	6,225,623	5/1/2001	Turner et al			7/30/1998

FOREIGN PATENT DOCUMENTS							
Examiner Initials	Cite No.	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation
							Yes No
	3	DE 39 31 497	18 Apr 1991	Germany			X
	4	DE 41 26 927	13 Aug 1992	Germany			X
	6	EP 0 672 243	29 Mar 2000	Europe			X
	7	DE 199 33 924	02 Nov 2000	Germany			X
	8	WO 95/00833	5 Jan 1995	WIPO			X
	9	DE 39 04 142	23 Aug 1990	Germany			X
	10	DE 196 50 397	10 Jun 1998	Germany			X
	13	WO 98/53296	26 Nov 1998	WIPO			X
	14	WO 96/18893	20 Jun 1996	WIPO			X
	16	WO 01/73816	26 Jan 2001	WIPO			X

OTHER PRIOR ART & NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	
	11	XP-002253739, Article by Dianne M. Levermore
	17	XP-002253740, Article by Thomas Fruh
	18	XP-002253741, Article by Dipl.-Ing. F. Plenert

<b>Examiner</b>		<b>Date</b>	
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10/10/2003